

NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD

WELL DECOMMISSIONING

(NO.)
CODE 351

DEFINITION

Well decommissioning is the sealing and permanent closure of a water well no longer in use.

PURPOSES

This practice serves to:

- Prevent entry of contaminated surface water into well and migration of contaminants into the unsaturated (vadose) zone or saturated zone;
- Prevent entry of vermin, debris, or other foreign substances into the well or well bore hole;
- Eliminate the physical hazard of an open hole to people, animals, and farm machinery; and
- Prevent the commingling of chemically or physically different ground waters between separate water bearing zones.

CONDITIONS WHERE PRACTICE APPLIES

This standard applies to sealing a well that is no longer used as a water supply, or when geological conditions exist that may allow cross contamination between aquifers.

In addition, this standard only applies when the owner of the well has an approved plan (from the Illinois State Department of Public Health) for sealing the well and can document compliance with those plans or has employed a licensed (in Illinois) water well drilling firm to decommission the well.

This practice does not apply to wells that were used for waste disposal, or if evidence of

contamination in the well exists. This practice does not apply to wells that contain contaminant levels that exceed state or federal water quality standards. Treatment of contamination source(s) is required before a well is decommissioned.

CRITERIA

All planned work shall comply with General Manual Title 450-GM, Part 405, Subpart A, Compliance with Federal, State, and with local laws and regulations as set forth in the Illinois Water Well Construction Code, Section 920.120 (Abandoned Wells).

Data collection - All available data for the well shall be collected and reviewed from as-built construction and maintenance records; i.e., well log, the materials schedule, length, and diameter of casing, total well depth, type of liners and screens, and related information. The existing conditions of the well shall be documented as described in the "Plans and Specifications" section.

Well preparation - The well shall be cleared of all pumping equipment, valves, pipelines, casing liners, debris, and other foreign material.

Casing - Where the well casing cannot readily be removed, and an open annular space exists between the outside of the casing and the well bore, then the annular space must be sealed, using sealing materials described in this standard. Sealing materials can be directed into the annular space as grout. As alternative the casing may be ripped or perforated to ensure that sealing materials completely fill the casing and any annular space. Also see "Surface Seal" part of this standard.

Disinfecting - Before sealing, the well water shall be brought to a 100-ppm chlorine

concentration or other solution specified by local or state requirements.

Sealing requirements – Water well borings, or monitoring wells which are abandoned shall be sealed by placing the sealing materials from the bottom of the well to the surface by methods that will avoid segregation or dilution of material in accordance with Illinois Water Well Code, Section 920.120 – Abandoned Wells.

Sealing materials - All materials used for sealing any portion of the well shall have a hydraulic conductivity equivalent to or less than that of the lowest hydraulic conductivity of the geologic materials being sealed. Properties of sealing materials shall conform to characteristics listed in Illinois Water Well Code, Section 920.120 – Abandoned Wells.

Fill materials – Fill materials may vary depending on well construction and the composition of the formation, however the materials used must be in conformity with Illinois Water Well Code, Section 920.120 – Abandoned Wells. Fill materials shall be clean and free of organic or other foreign matter. The gradation shall be such that bridging will not occur during placement.

Surface seal - The casing shall be completely removed from the well or cut off at a depth not less than 3 ft. below ground surface or at the maximum depth of frost penetration, whichever is greater. Local frost heave and fracturing hazards shall be considered in the design of the surface seal. An interval not less than 3 ft. below the cut-off casing shall be sealed with sealing materials. These materials may be an extension of the sealing materials used below this depth.

The interval between the ground surface and the top of the cut-off casing shall be filled with soil materials that achieve an in-place hydraulic conductivity equivalent to or less than the surface soil surrounding the well. The ground surface at the sealed well site shall be mounded and graded in a manner that prevents ponding of surface runoff.

Additional criteria to prevent commingling of ground waters between separate water-bearing zones:

Wells with open annular space around the casing shall be treated in a manner that seals the voided annular space. Methods of treatment include (1) removing the casing or (2) grouting the casing in place.

Casing removal is acceptable when the entire casing can be removed from the well. Casings removed from a collapsing formation shall be grouted concurrent with removal such that the bottom of the casing remains submerged in the grout.

Casings grouted in place shall employ a grouting procedure that will fill the open space. Perforated or ripped casing shall provide sufficient apportioned open area to assure passage of the grout to the annular space. The casing shall be perforated or ripped throughout the entire length of a confining layer.

PLANNING CONSIDERATIONS

This practice may be part of a ground water protection system that includes water and chemical management practices.

To the extent practicable, an abandoned well should be decommissioned in a manner that restores the original hydrogeologic conditions of the well site and does not preclude the use of the site from future land management practices.

Decommissioning requires special consideration of specific geological, biological, physical, and climatic conditions, the chemical composition of the surrounding soil, rock, and ground water at the well site, and the well's construction. The proximity of the abandoned well to other planned or existing wells and the hydrologic conditions of the area should be considered when decommissioning abandoned wells.

NOTIFICATION

The Illinois Department of Public Health or the approved unit of local government shall be notified by telephone or in writing at least 48 hours prior to the commencement of any work to seal a water well.

PLANS AND SPECIFICATIONS

Plans and specifications for decommissioning abandoned water wells shall be consistent with this standard and shall describe the requirements for applying the practice to achieve its intended purposes.

DOCUMENTATION OF DECOMMISSIONING

Minimum documentation of construction to decommission a well shall consist of an approved (by Illinois State Department of Health) plan and a water well sealing form (IL 482-0631).

A record of the installation of this practice shall be made and to include the following information:

- Location of the decommissioned well by latitude/longitude, township/range, or other georeference convention, of such precision that it can be readily located in the field, if required, in the future.
- Date well was constructed (if known)
- Date of well decommissioning
- Type of water well (e.g. bored, dug, driven, or drilled)

- Name of landowner
- Total depth of well
- Inside diameter of well bore or casing
- Casing material type or schedule (e.g., standard weight steel, or PVC sch-80).
- Static water level measured from ground surface
- Types of materials used for filling and sealing, quantities used, and depth intervals for emplacement of each type.
- Signature of person responsible of sealing the well.

The completed report shall be submitted not more than 30 days after the well was sealed.

OPERATION AND MAINTENANCE

The decommissioned well site shall be maintained in such a manner as to be consistent with adjacent land use(s). If general subsidence of the area overlaying the sealed well occurs, sufficient soil material shall be added to maintain a positive slope away from the abandoned well.